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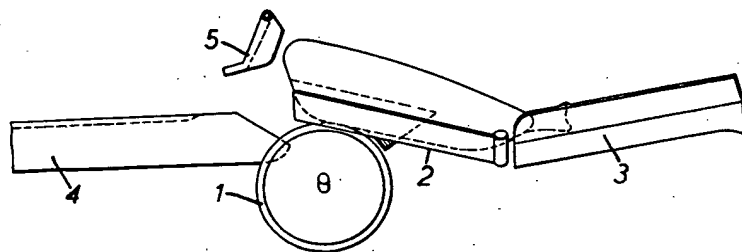


FIG. 4.

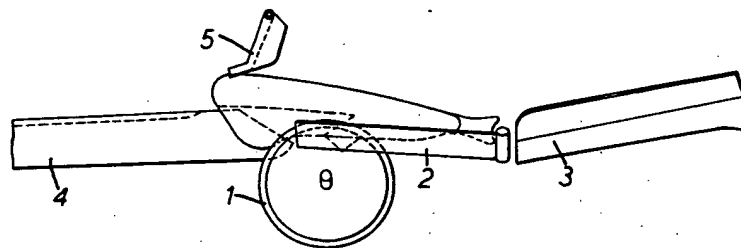


FIG. 5.

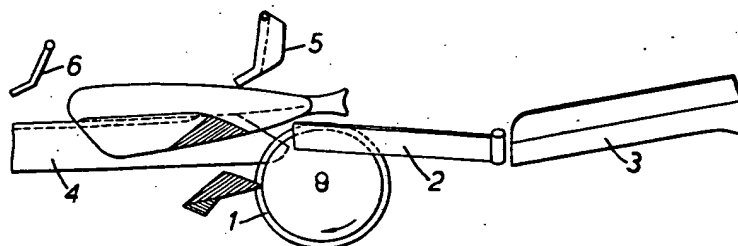


FIG. 6.

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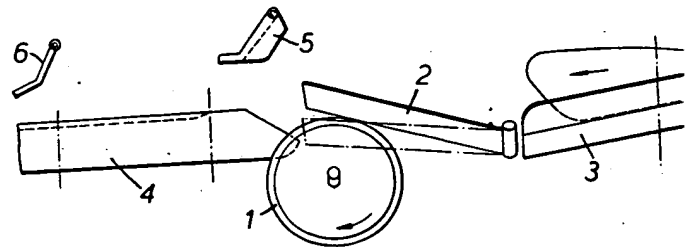


FIG. 1.

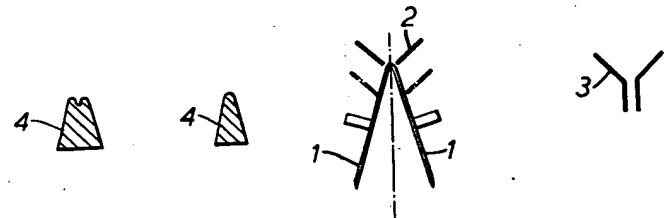


FIG. 2.

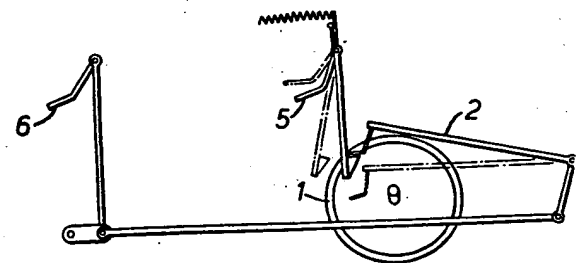


FIG. 3.

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# PATENT SPECIFICATION

DRAWINGS ATTACHED

1073,779



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No. 50039/63.

Application made in Germany (No. N22515 X/34I) on Dec. 21, 1962

Complete Specification Published: June 28, 1967.

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at acceptance:—A2 U1

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## COMPLETE SPECIFICATION

### Method and apparatus for Opening up the Rear Portion of the Belly Side of Fishes

I, RUDOLF GEORG THEODOR BAADER, a German National sole responsible partner of the firm trading as NORDISCHER MASCHINENBAU RUD. BAADER of Lubeck, Geninerstrasse 249, Germany, do hereby declare the invention for which I pray that a patent may be granted to me, and the method by which it is to be performed to be particularly described in and by the following statement:—

The present invention relates to a method of processing fish and has particularly for its object to prepare properly for further working in filleting machines fishes which have a rearwardly extending pocket extending upwards and rearwards from the anus.

It is known that there are two fundamentally different kinds of belly cavities in fishes, namely one kind found e.g. in Norwegian Haddock or redfish in which the upper margin of the belly cavity extends from the head end first under the backbone and then in a more or less flat curve to the anus and another kind, found e.g. in cod, pollock, haddock and whiting (known as fish of the family Gadidae) in which the upper margin extends right along the underside of the backbone towards the rear far beyond the region of the anus, whence a front wall extends back at an incline in a forward direction to the anus. This produces a rearwardly projecting pocket which makes it difficult not only to clean the belly cavity but also to guide the fish during the further treatment.

These difficulties in guiding occur particularly when, for example in a filleting machine, a spike is penetrated from the head end under the backbone into the belly cavity and the fish is to slide over the saddle guide following the spike. Substantially all fish of the Gadidae family have a rearwardly projecting pocket extending from the rear end of the belly cavity and therefore cannot be worked on these machines because the spike penetrating the belly cavity merely sticks in the rearwardly project-

ing pocket of the belly cavity so that the fish becomes jammed entirely or has to be moved on by force. Fishes with a belly cavity extending in a curve to the anus pass the spike without difficulty even when the belly cavity is opened up, because the spike forces its way out through the anus again.

The object of the method according to the invention is to overcome these difficulties, it being taken into consideration that the same conditions as regards the guide path available for the spike or other guiding elements engaging the belly cavity must be produced for fish having the said rearwardly extending cavity as in the case of other fishes. This is attained in that, according to the invention a method of processing fish includes the steps of severing a ventral portion of the body of a fish situated to the rear of the belly cavity together with the rear under-fin and its attachments by making a pair of upwardly converging cuts one from each side of the ventral part of the fish located to the rear of the belly cavity. Thus the rear portion of the belly side of the fish can be opened up so that a continuation of the upper margin of the belly cavity is obtained in a similar way to the way in which the upper margin extends to the anus in fishes not having the rearwardly extending pocket. As a result perfect guiding is ensured even in the case of spikes followed by saddle-like guides, quite apart from the fact that easy cleaning of the belly cavity is now possible in the case of fish having the said rearwardly extending pockets.

The new method can obviously also be used for all kinds of fish because even in the case of fish without the rearwardly extending pocket the removal of the additional ventral portion when opening up the rear portion of the belly side facilitates further working. It is advantageous to feed the fish on to a pivoted double guide comprising two pivoted halves or parts forming a trough or channel and to lower

[Price 4s. 6d.]

it on to a pair of knives by swinging the two guide halves downwards and laterally apart.

5 The double guide is preferably controlled so that a feeler operated by the leading end of the fish effects the swinging apart of the two guide parts and the downward movement thereof. For swinging the parts back into their initial or rest position a second feeler is preferably used which is also operated by the leading  
10 end of the fish.

It is evident that the return movement can also be effected by the first feeler returning into its initial or rest position.

15 The apparatus for carrying out the method according to the invention is extremely simple and includes a double guide comprising two pivoted halves or parts forming a channel under which a pair of rotary knives is arranged, while above the double guide a feeler lever is provided for controlling the double  
20 guide so as to alternately to cover or expose the knives.

The apparatus may include one feeler controlling the exposure of the knives and second feeler controlling the covering thereof. The pair of knives preferably consists of two circular knives standing at an acute angle to each other.

30 To explain the method more clearly, an embodiment of the invention is hereinafter described with reference to the accompanying drawings in which:—

35 Figure 1 is a diagrammatic side elevation of an apparatus for carrying out the method according to the invention;

Figure 2 illustrates a number of cross-sectional views of the apparatus of Figure 1;

40 Figure 3 illustrates a feeler arrangement; and

Figures 4, 5 and 6 show consecutive operations being carried out on a fish.

45 The apparatus comprises a pair of circular knives 1 standing at an acute angle to each other and which can be covered or exposed by a double guide 2. The circular knives 1 are used, as shown in Figure 6, to cut out a ventral portion of the belly comprising a strip located from the rear of the anus to the rearwardly projecting end of the belly cavity together with the rear under fin and its supports. In the arrangement shown in Figure 1 the knives 1 and the double guide 2 are located after an outer guide 3 and in front of a saddle guide 4. Figure 2 shows the parts 1 to 4 in cross-section, while Figure 3 is a diagram showing a length feeler 5 which is actuated, for example, by the head, i.e. the leading end of the fish for releasing the guide  
60 2. This release takes place when the leading end of the fish is at least over the middle of the knives so that the sump of the backbone cannot run up against the knives, but before the end of the belly cavity has reached the cutting edge of the knives. If the belly cavity

is also to be cut open, the pair of knives must obviously cut correspondingly earlier.

When the fish has passed through, the catch of the feeler 5 is in a position ready to lock the guide 2 again. This takes place when the guide is once more released and can be effected, as shown in Figure 3, by a feeler 6 which is swung by the fish as it continues along its path of travel. Figure 4 shows the position of the fish before the feeler 5 is operated, Figure 5 the position of the fish after the guide 2 has been released during the cutting operation and Figure 6 the position of the fish before it reaches the return feeler 6, the cut being indicated by cross-hatching. In the example illustrated, the fish is not yet cut open to the backbone. The ventral or wedge portion which is cut out is shown in Figure 6.

#### WHAT I CLAIM IS:—

1. A method of processing fish including the step of severing a ventral portion of the body of a fish situated to the rear of the belly cavity together with the rear under fin and its attachments by making a pair of upwardly converging cuts one from each side of the ventral part of the fish located to the rear of the belly cavity.

2. A method according to Claim 1, where in the same operation the belly cavity is first slit open to the anus and then the ventral portion is subsequently severed.

3. A method according to Claim 1 or Claim 2, in which the fish is fed onto a double guide comprising two pivoted halves or parts forming a channel and then swung down lowered on to a pair of knives by swinging the two guide halves downwards and laterally apart.

4. A method according to Claim 3 in which the double guide is controlled by at least one feeler operated by the leading end of the fish.

5. A method according to Claim 4, in which one feeler is provided for controlling the movement of the double guide from an initial position to an operative position and another feeler is provided for controlling its return movement to the initial position.

6. Apparatus for opening up the rear portion of the belly side of fishes including a double guide comprising two pivoted halves or parts forming a channel under which a pair of rotary knives is arranged, while above the double guide a feeler lever is provided for controlling the double guide so as to alternately to cover or expose the knives.

7. Apparatus according to Claim 6 including one feeler controlling the exposure of the knives and a second feeler controlling the return thereof.

8. Apparatus according to Claim 6 in which the pair of knives consists of two circular knives standing at an acute angle to each other.

9. Apparatus for opening up the rear portion of the belly side of fishes including a double guide comprising two pivoted halves or parts forming a channel under which a pair of rotary knives is arranged, while above the double guide a feeler lever is provided for controlling the double guide so as to alternately to cover or expose the knives.

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panying drawings.

KILBURN & STRODE,  
Chartered Patent Agents,  
Agents for the Applicant.

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